THE BLACK LINE

BLK-CPV700RH High Performance 700TVL Extended Temperature Range Vandal-proof CCTV Dome Camera User Manual

Products: BLK-CPV700RH

BLK-CPV700RH camera

Please read this manual before using your camera, and always follow the instructions for safety and proper use. Save this manual for future reference.

BLK-CPV700RH_CM
12/9/13

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

CAUTION

To prevent electric shock and risk of fire hazards, do NOT use other than the specified power source.

REGULATORY NOTICE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and use in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

LEGAL NOTICE

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For Sales and Support, please contact your distributor.

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Precautions

- **This camera should be installed by qualified personnel only.**
- **There are no user serviceable parts inside.**
- **Do not disassemble this camera other than to make initial adjustments.**
- **Use a UL approved regulated 24 volt AC or 12 volt DC power supply.**
- **Use appropriate low voltage power cable to prevent fire or electrical shock.**
- **Please insure that your installation area can support the weight of the camera.**

Handle this camera carefully

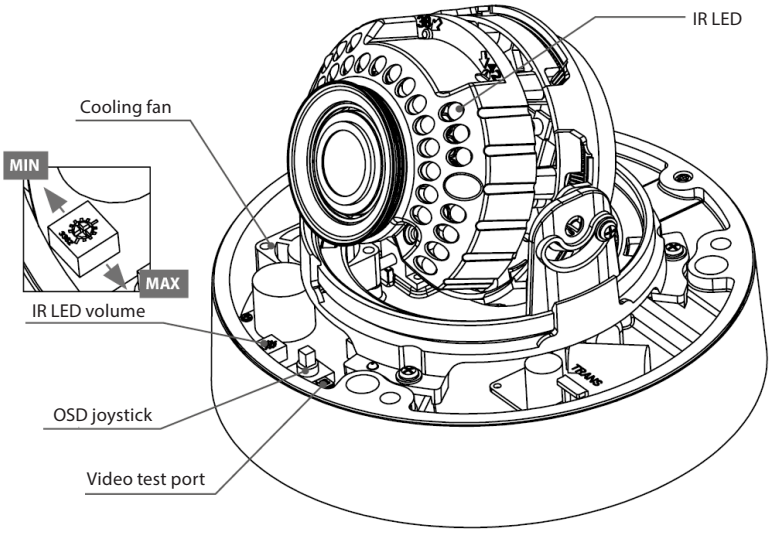
- **Do not use a strong or abrasive detergent when cleaning the camera.**
- **Do not install near cooling or heating devices.**
- **Do not install the camera in extreme temperature conditions.** Use the camera in environments where temperature is within -40 °F to 122 °F. Use adequate ventilation if a camera is installed where high temperatures may occur.
- **Do not install or use the camera in an environment where the humidity is high.** Very high humidity levels can reduce image quality.
- **Do not install the camera under unstable lighting conditions.** Severe lighting change or flicker can cause the camera to work improperly.
- **Do not touch the front lens of the camera.** Be careful not to leave fingerprints on the lens or camera dome.
- **Do not drop the camera or subject it to physical shocks.**
- **Do not expose the camera to rain or spill liquids on it.** If it gets wet, wipe dry immediately. Liquids can contain minerals that corrode the electronic components.
- **Do not expose the camera to radioactivity.** If exposed to radioactivity the CCD will fail.
- **Do not disassemble the camera.** There are no user-serviceable parts inside it.
- **Do not drop the camera or subject them to physical shocks.** It can cause malfunctions to occur.
- **Never point the camera at a strong light, or exposing it to a spotlight or an object reflecting the strong light.** Smear or blooming may occur, and it can damage the image sensor.
- **Before applying power to the camera, check the power source to ensure that it is within specifications.**

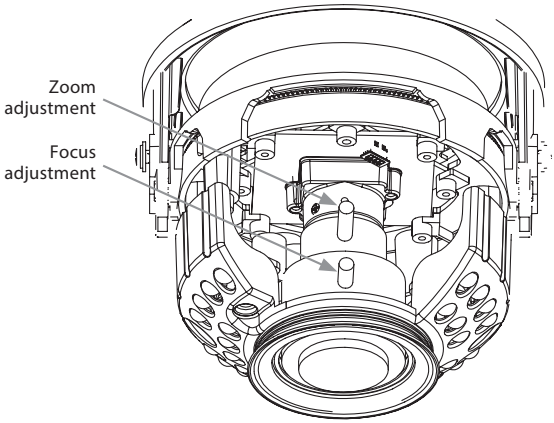
SECTION 1
Introduction

This high performance extended temperature CCTV dome camera feature a very high resolution CCD sensor providing 700 TVL, dual voltage range (24 Vac, 12 Vdc), and on-screen display (OSD) for control and setup. The BLK-CPV700RH camera features a vandal-proof case and is weather-proof with a cold temperature range to -40 °F.

1.1 Features

- 1/3" 960H Interline CCD sensor
- 700 TVL horizontal resolution
- Vandal-proof and weather-proof (IP66 rated)
- Varifocal (2.8 ~12.0 mm)
- True Day & Night (ICR) with built-in 30 IR LEDs
- Fast shutter speed (1/60 ~ 1/100,000 sec)
- 2D Digital Noise Reduction (2D DNR)
- Adaptive Tone-curve Reproduction (ATR): provides gradation compensation to improve the contrast of subjects both low-luminance areas and high luminance areas exist in the same picture.
- Back Light Compensation (BLC) and Highlight Compensation (HLC)
- 4-Zone Privacy Masking and Motion Detection
- Mirror / Brightness / Contrast / Sharpness / HUE / Gain image adjustments
- 12 Vdc / 24 Vac dual power
- Multilingual OSD
- Second video output for easy servicing





BLK-CPV700RH zoom - focus adjustment knobs

1.1.1 What's in the box

Your camera includes the following:

- Camera assembly
- Four (3) coarse-threaded screws and wall inserts to secure the base to the mounting surface
- Torx® (T-20) L-wrench for removing the dome
- Surface mounting template
- Video test port to BNC adapter cable
- This manual

1.1.2 Tools you need

To install the camera, you will need:

- 12 Vdc or 24 Vac power source
- Tools for mounting the camera
- Plillips #2 screwdriver
- Video and power extension cables, if needed
- Hand-held CCTV video setup monitor (optional)

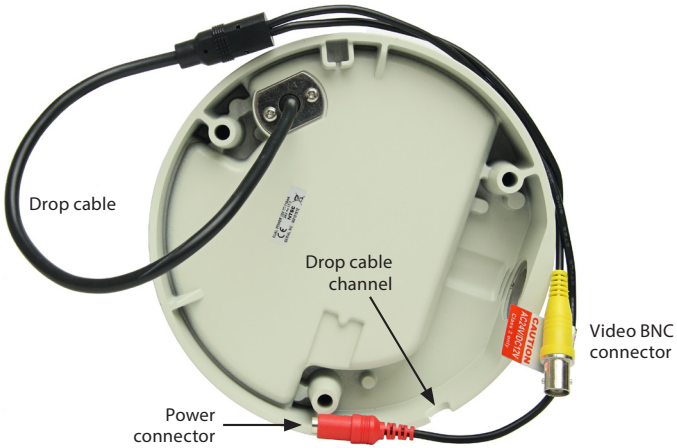
SECTION 2
Installation

2.1 General Guidelines

The camera can be mounted on a flat surface (surface mounted, usually on a ceiling). The camera drop cable can be routed through a hole in the ceiling, or through a cable channel on the side of the camera base.

Following are some general guidelines for installing the camera.

- **Camera Lens**: Handle the camera dome carefully to prevent scratching or soiling the dome and lens. If the dome or lens becomes soiled, clean it only with approved products. See the **Cleaning** section later in this manual.
- **Monitor impedance**: Set the monitor impedance switch to 75Ω.
- **Power supply**: To avoid fire or shock hazard, use only a UL listed power supply.
- **Camera drop cable**: The camera drop cable includes two connectors:
  - **Power connector** (red sleeve) – Use 24 Vac power source (AC24V 1A adapter) or 12 Vdc power source (DC12V 1A adapter). When connecting 12 Vdc power to the camera power drop. When connecting 12 Vdc power to the drop cable connector, observe the polarity - the center tap must be positive compared to the outer shield.
  - **Video coax connector** (BNC, yellow sleeve) – for transmission of the video signal across coax (75 Ω) cable.



Video (yellow) and power (red) drop cable connectors

2.2 Mounting the camera

The camera can be mounted onto an electrical box, mounting bracket, or flat surface with sufficient strength to support it.

SECTION 2: INSTALLATION

When the camera is surface mounted, the drop cable can be routed through a hole within the perimeter of the base, or through the cable channel on the side.

1. Determine (and acquire, if needed) the best type of fasteners for attaching the camera to the mounting surface. The mounting screws and wall inserts provided are adequate for most surfaces.

2. Use the template provided to mark the location for the fasteners for mounting the camera. Also, if the camera drop cable will pass through the mounting surface, mark the location for the hole.

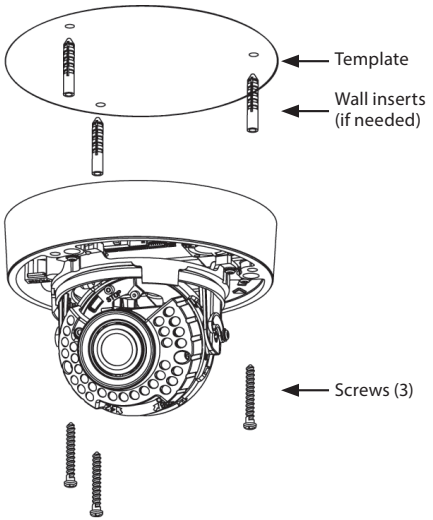
3. Drill holes in the mounting surface appropriate for the fasteners. Drill a 3/4" hole for the camera drop cable, if needed.

4. If needed, insert wall inserts in the screw holes.

5. Remove the camera dome cover from the camera. Loosen the three dome captive screws using the Torx L-wrench provided.

6. Route the drop cable through the cable channel on the side of the base, or through the hole drilled in the mounting surface.

7. Secure the camera to the mounting surface with three screws.

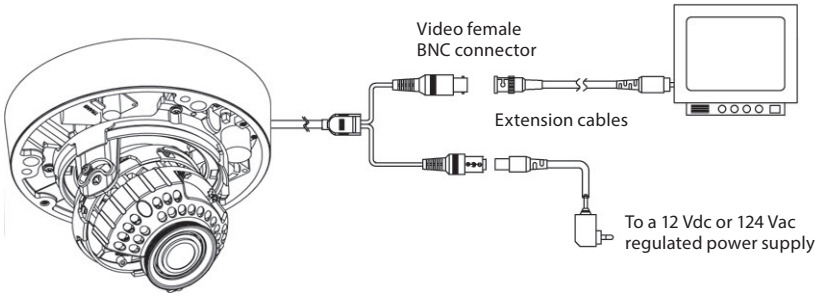


8. Connect the camera drop cable video and power leads to a video and power extension cable as needed. If using 12 Vdc to power your camera, ensure that +12 Vdc is applied to the center pole of the power drop cable connector.

CAUTION *When using 12 Vdc powering, use extreme caution to observe the polarity of the of the voltage applied to the camera. The camera power drop cable connector center lead should receive +12 Vdc when measured to the shield (ground).*

NOTE *Drop cable connectors are not waterproof.*

9. Attach the far end of the video extension cable to video monitoring equipment such as a monitor or DVR.



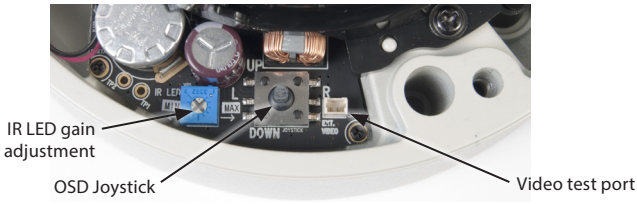
10. Attach the far end of the power extension cable to a 12 Vdc or 24 Vac power source.

11. Apply power to the camera. Verify that video from the camera can be seen on the video monitor.

2.2.1 Camera field of view adjustments

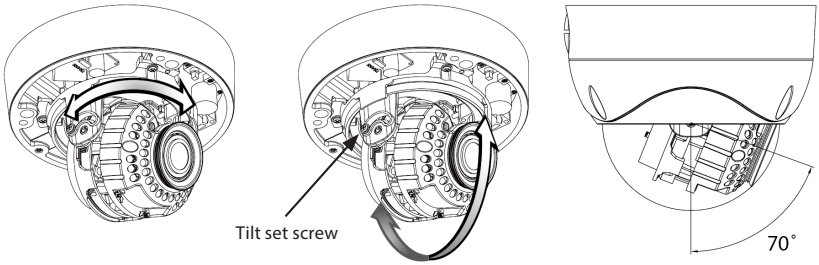
In this procedure, point the camera at your surveillance (field of view) target and adjust zoom and focus.

1. Monitor video from your camera. You can monitor video using your DVR/monitor, or by watching video with a setup monitor attached to the video test port. **NOTE**: A video test port to BNC adapter cable is provided.



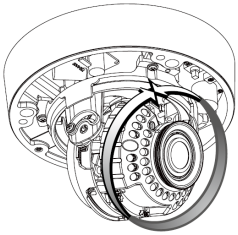
OSD Joystick

2. Adjust the pan and tilt camera gimbal to center the surveillance target in your camera video. Note that the tilt will adjust 70°. See the drawing below. Tighten the tilt set screw to hold the tilt adjustment in place.



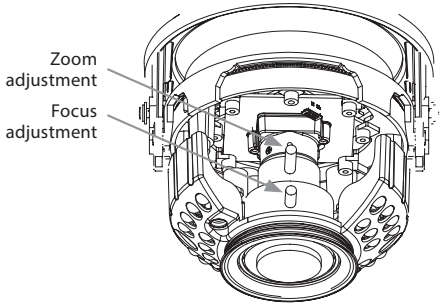
Pan adjustment | Tilt adjustment | Tilt angle

3. Adjust the camera Rotation to align the horizon in the video image.



Camera rotation

4. Adjust the camera zoom and focus to frame and clarify the image. Turn each adjustment knobs counterclockwise to loosen, push right or left to produce the best image, then turn the knob clockwise to tighten.

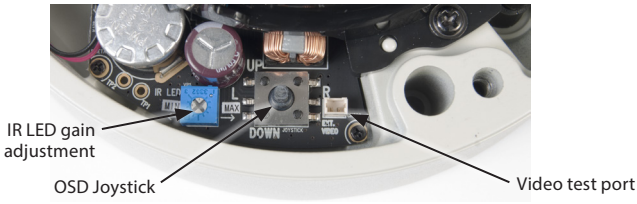


5. Perform the OSD software setup of your camera to produce the best video image in all environmental conditions. See Section 3, OSD Software Setup, for more information.

6. Reinstall the dome cover.

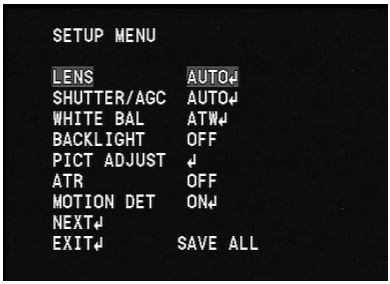
SECTION 3
OSD Software Setup

The OSD (On Screen Display) software setup menus can be viewed from the camera video output or through the VIDEO TEST port on the OSD Control board. The OSD control board is accessible when the camera dome is remove. Configuration settings are made using the OSD joystick (see photo below).



OSD Joystick

Use the SETUP joy stick on the OSD control panel to navigate through the menu system. Press the joy stick in (toward the control board) to open the SETUP menu or select an entry, rock the stick up or down to highlight an item in the list, and left or right to change the option (right column) of the highlighted item. When an option contains a ↵ symbol, selecting that option opens a sub-menu.



The MAIN menu consists of a list of sub-menus or displays the option selected for a camera function. When sub-menus are available, the ↵ symbol is shown.

3.1 OSD menu tree

Table 1. OSD menu

MAIN MENU	1st Sub MENU	2nd Sub MENU	3rd Sub MENU	4th Sub MENU
LENS	MANUAL			
	AUTO	TYPE	DC	
		MODE	AUTO,OPEN,CLOSE	
		SPEED	(000 ~ 255)	
		RETURN		

SECTION 3: OSD SOFTWARE SETUP

MAIN MENU	1st Sub MENU	2nd Sub MENU	3rd Sub MENU	4th Sub MENU
SHUTTER / AGC	AUTO	HIGH LUMINANCE	MODE	AUTO IRIS, SHUT+AUTO IRIS
			BRIGHTNESS	(000 ~ 255)
		LOW LUMINANCE	MODE	AGC, OFF
			BRIGHTNESS	x0.25, x0.50, x0.75, x1.00
		RETURN		
	MANUAL	MODE	SHUT+AGC	
		SHUTTER	1/100, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000	
		AGC	6, 12, 18, 24, 30, 36, 42, 44.8	
		RETURN		
WHITE BAL	ATW	SPEED	(000 ~ 255)	
		DELAY CNT	(000 ~ 255)	
		ATW FRAME	x0.50, x1.00, x1.50, x2.00	
		ENVIRONMENT	INDOOR, OUTDOOR	
		RETURN		
	PUSH			
	USER1	B-GAIN	(000 ~ 255)	
		R-GAIN	(000 ~ 255)	
		RETURN		
	USER2	B-GAIN	(000 ~ 255)	
		R-GAIN	(000 ~ 255)	
		RETURN		
	ANTI CR			
	MANUAL	LEVEL	24 ~ 103	
		RETURN		
	PUSH LOCK			
BACK LIGHT	OFF, BLC, HLC			

MAIN MENU	1st Sub MENU	2nd Sub MENU	3rd Sub MENU	4th Sub MENU
PIC ADJUST	MIRROR	OFF,ON		
	BRIGHTNESS	(000 ~ 255)		
	CONTRAST	(000 ~ 255)		
	SHARPNESS	(000 ~ 255)		
	HUE	(000 ~ 255)		
	GAIN	(000 ~ 255)		
	RETURN			
ATR	ON	LUMINANCE	LOW,MID,HIGH	
		CONTRAST	LOW, MIDLOW, MID, MIDHIGH, HIGH	
		RETURN		
	OFF			
MOTION DET	ON	DETECT SENSE	(000 ~ 127)	
		BLOCK DISP	OFF, ON, ENABLE (CONTROLLER)	
		MONITOR AREA	ON,OFF	
		AREA SEL	1/4, 2/4, 3/4, 4/4	
			TOP	(000 ~ 244)
			BOTTOM	(000 ~ 244)
			LEFT	(000 ~ 474)
			RIGHT	(000 ~ 474)
		RETURN		
	OFF			
NEXT				
EXIT				
SAVE ALL				

SECTION 3: OSD SOFTWARE SETUP

MAIN MENU	1st Sub MENU	2nd Sub MENU	3rd Sub MENU	4th Sub MENU
PRIVACY	ON	AREA SEL	1/4, 2/4, 3/4, 4/4	
			TOP	(000 ~ 244)
			BOTTOM	
			LEFT	(000 ~ 474)
			RIGHT	(000 ~ 474)
		COLOR	(1 ~ 8)	
		TRANSP	0.00, 0.50, 0.75, 1.00	
		MOSAIC	OFF,ON	
		RETURN		
	OFF			
NR	NR MODE	OFF,Y,C,Y/C		
	C LEVEL	(000 ~ 015)		
	Y LEVEL	(000 ~ 015)		
	RETURN			
CAMERA ID	ON	EDIT MODE		
		RETURN		
	OFF			
LANGUAGE	ENGLISH,JAPANESE, DEUTSCH, FRANCAIS, Русский, PORTUGUÊS, ESPAÑOL			
CAMERA RESET				
BACK				
EXIT				
SAVE ALL				

***Important Note:**

- Save changes made to the camera settings menus before exiting the OSD menu.
- Changing the lens option in the OSD from MANUAL to AUTO will automatically change the SHUTTER / AGC setting from AUTO IRIS to SHUT+AUTO IRIS. (Default: AUTO IRIS)

3.2 OSD Description

LENS

The LENS options include two modes: MANUAL and AUTO. In MANUAL mode, the camera uses an automatic electronic shutter.

In AUTO mode, you can set the mechanical lens to fully OPEN, fully CLOSED, or automatically controlled by the camera. SPEED sets set the convergence speed of the mechanical iris. The lower the value, the faster the speed. If the speed is too slow or too fast, iris control may be unstable.

SHUTTER / AGC

The SHUTTER / AGC control has two submenus: AUTO and MANUAL. In AUTO mode, the camera controls the shutter and iris based on the BRIGHTNESS level for both HIGH LUMINANCE and LOW LUMINANCE fields of view.

- In AUTO IRIS mode, the light level is controlled by an auto iris lens only.
- In SHUT+AUTO IRIS mode, light level is controlled by the combination of the auto iris lens and shutter control. This mode generally minimizes washout and produces a better dynamic range. Shutter speed can vary from 1/60 to ~ 1/10,000 sec.

In MANUAL mode, you can preset constant values for the shutter and gain (AGC) levels to constants.

WHITE BAL

WHITE BAL (balance) submenus are used to set the color temperature of the camera to match the color temperature of the field of view. You can create two preset modes, USER1 and USER2, to use when the scene changes between two common light conditions, or preset a constant (MANUAL) color temperature correction.

ATW (Auto Tracking White balance) limits the color temperature range at about 2,500 °K ~ 8,500 °K to reduce the excessive compensation for big objects that have a single color.

Use the PUSH option to allow the camera to automatically set the white balance in all lighting conditions.

ANTI CR (Anti Color Rolling) can reduce color rolling under the fluorescent light when the camera operates in shutter control without an auto iris lens.

The PUSH LOCK feature provides an alternate way to set the luminance level of the field of view. To use PUSH LOCK, point the camera at a white paper in the field, then press ENTER. If the environment lighting changes, repeat this procedure to reset the camera.

Backlight

- BLC - Back light compensation. A function of the camera that compensates for excessive light directed at the camera causing the video to bloom or causing the images in front of the light to be unusable.
- HLC - Headlight compensation. This option blocks very bright light in the image.

PIC ADJUST

Use PIC (picture) ADJUST to improve the live view image from the camera.

ATR

Adaptive Tone-curve Reproduction (ATR) provides gradation compensation to improve the contrast of subjects when both low luminance areas and high luminance areas exist in the same picture. You can adjust the ATR luminance and contrast levels in the ATR submenus .

Motion Detection

Motion detection is used trigger recording when motion is detected in the image. You can enable areas (BLOCKS) of the image where you want to sense for motion, and set the sensitivity (DETECT SENSE) to a level that best triggers when objects of a minimum size is to be detected.

NR

NR MODE (noise reduction) is used to select to use preset noise reduction values for luma, chroma, or both.

- Y LEVEL: Select to set a specific gamma setting for luma.
- C LEVEL: Select to set a specific gamma setting for chroma.

Camera ID

Use to display the camera identifier in the video image.

CAMERA RESET

Select to reset the camera options to the factory default values.

RETURN

Return to the previous higher level menu.

SAVE ALL

Save all current setting and Close OSD menu. These setting are loaded and applied automatically when the Camera is power on.

EXIT

Close OSD menu. Camera's current setting is not saved.

SECTION 4
Cleaning

Clean the camera dome with an approved glass cleaning solution and a lint free cloth.

- Dust can be removed from the unit by wiping it with a soft damp cloth. To remove stains, gently rub the surface with a soft cloth moistened with a mild detergent solution, then rinse and dry it with a soft cloth.
- Remove all foreign particles, such as plastic or rubber materials, attached to the camera housing. These may cause damage to the surface over time.

Do not use benzene, thinner or other chemical products on the camera assembly; these may dissolve the paint and promote damage of the surfaces. Before using any chemical product, read the accompanying instructions carefully.

SECTION 5
Specifications

Table 2. Component Specifications

Feature	Specification
Image Device	1/3" 960H Interline CCD II
Scanning System	2:1 Interlace
H. Resolution	700 TV Lines
Scanning Frequency	H:15.734 KHz, V:59.94 Hz
Total Pixels	1020 (H) x 508 (V)
Effective Pixels	976 (H) x 494 (V)
Synchronization	Internal
Lens size	Varifocal: 2.8 ~12.0 mm
Electronic Shutter Speed	1/60 – 1/10000 sec
S/N Ratio	More than 50 dB (AGC Off)
Gamma	r = 0.45
Min. Illumination	COLOR : 0.05 lux / B/W : 0.02 lux
Sync System	Internal
Video Output	1.0 Vp-p composite (75 Ω)
OSD	Built in (inner key / joystick)
BLC	OFF / BLC / HLC
White Balance	ATW / PUSH / USER1 / USER2 / ANTI CR / MANUAL / PUSH-LOCK
2DNR	OFF / ON (level adjustable)
ATR	OFF / ON (level adjustable)
Min. Illumination	0 Lux (IR LED on)
IR LED	850 nm, 30 LEDs
IR Beam Range	Up to 98 feet (30 meters)
IR LED Operation	On: 1 lux, Off: 3 lux
Picture Adjust	MIRROR / BRIGHTNESS / CONTRAST / SHARPNESS / HUE / GAIN
Privacy Masking	OFF / ON (4 zones)
Motion Detection	OFF / ON (4 zones)
Language	ENGLISH / JAPANESE / GERMAN / FRENCH / RUSSIAN / PORTUGUESE / SPANISH / CHINESE
IP Rating	IP66 (weatherproof)

Feature	Specification
Power Consumption	12 Vdc (± 10 %) maximum 620 mA
	Dual voltage: 12 Vdc (±10 %) maximum 710 mA , 24 Vac (±10 %) maximum 17.3 W
Operating Temperature	-40 °F ~ 122 °F (-40 °C ~ +50 °C) with heater
Storage Temperature	-4 °F ~ 140 °F (-20 °C ~ +60 °C)
Operating Humidity	Relative humidity (RH) < 80 %
Options	Dual power, fan, heater
Dimension (mm)	5.95" (Φ) x 4.86" (V) (151 mm (Φ) x 123.4 mm (V))
Weight	31 oz (880 g)

APPENDIX A Glossary

Terms and definitions

Term	Definition
AGC	Automatic Gain Control, an electronic circuit that amplifies the video signal when the strength of the signal falls below a given value.
ALC	Photometric control, measures light intensity. Determines the iris reaction sensitivity. Sensitivity is increased when the potentiometer is turned towards PEAK, and decreased when turned towards AVERAGE.
APERTURE	The opening of the lens which controls the amount of light reaching the surface of the pickup device. The size of the aperture is controlled by the iris adjustment.
APERTURE SCALE	The aperture scale is referred to as a F-number. The international aperture scale is: F1, F1.4, F2, F2.8, F4, F4.6, F8, F11, F16, etc.
AUTO-IRIS LENS	A lens with a electronically controlled iris. This allows the lens to maintain one light level throughout varying light conditions.
BLC	Back light compensation. A function of the camera that compensates for excessive light directed at the camera causing the video to bloom or causing the images in front of the light to be unusable.
CAMERA FORMAT	The approximate size of a camera image pickup device. This measurement is derived from the diagonal line of a chip or the diameter of the tube. Currently there are five format sizes in the CCTV industry 1", 2/3", 1/2", 1/3" and, 1/4"
DC TYPE AUTO-IRIS	Auto-iris lenses where the iris is controlled by the circuitry of the camera.
DEPTH OF FIELD	The regions in front of and behind the focused distance where the image remains in focus. With a greater the depth of field, more of the scene near to far is in focus. Lens aperture and scene lighting will greatly influence the D.O.F.
F-NUMBER	Indicates the brightness of the image formed by the lens, controlled by the iris. The smaller the F-number the brighter the image.
FIELD OF VIEW	The horizontal or vertical scene size at a given length from the camera to the subject.
FOCAL LENGTH	The distance from the center of the lens to a plane at which point a sharp image of an object viewed at an infinite position. The focal length determines the size of the image and angle of FOV seen by the camera through the lens. This is the center of the lens to the image pickup device.
HUNTING	An industry term used to describe a auto-iris lenses inability to stabilize under certain light conditions.
IRIS	A mechanical diaphragm which can be controlled manually or automatically to adjust the lens aperture.
LENS FORMAT	The approximate size of a lens projected image. In most cases the lens will project a image slightly greater than the designated image size to insure the pickup device is completely covered. It is recommended that camera and lenses are the same format size. A lens a larger format size can be used on a smaller format camera, however a smaller format lens should never be used with a larger format camera.
LEVEL CONTROL	Used to set the auto-iris circuit to a video level desired by the user. Turning the level potentiometer towards the HIGH position will open the iris allowing more light to pass through the lens, towards the LOW will close the iris allowing less light to pass through the lens.
MANUAL IRIS LENS	A lens with a manual adjustment to set the iris opening (aperture) to a fixed position. This type lens is generally used in fixed lighting conditions.
TELEPHOTO	Telephoto is a term used to describe lenses that have a high focal number causing the reproduced image to appear larger than human eye reproduction.
VARIFOCAL	A low cost version of a zoom lens designed to meet installers needs for versatility. This lens does not have the ability to track from wide to telephoto.

APPENDIX B
Troubleshooting

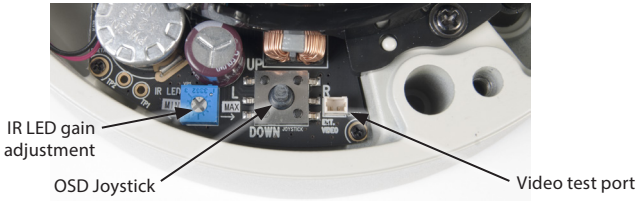
Problem	Possible Cause
Nothing appears on the screen	- Check the power connection. - Check the video signal cable connection to the monitor.
The video image is dim or not clear.	- If the camera lens is dirty, clean it with a soft, clean cloth. - Adjust the monitor controls, if necessary. - If the camera is facing a very strong light, change the camera position. - Adjust the lens focus.
The screen is dark.	- Adjust the contrast control of the monitor. - If you have an intermediate device, set the impedance (75Ω /Hi-Z) properly, and check the cable connections.
The camera is not working properly and the surface of the camera is hot.	- Verify that the camera is correctly connected to an appropriate regulated power source.
The MOTION DETECTION function is not working	- Is "MOTION DETECTION" mode turned on? - Check the setting of the MD AREA.
The image on the monitor flickers	- Make sure that the camera isn't facing direct sunlight or fluorescent light. If necessary,change the camera position.
Colors are not quite right.	- Check the settings in the WHITE BAL menu.
The SENS-UP does not work.	- Verify that the AGC setting in the EXPOSURE menu isn't set to OFF. - Check the SHUTTER setting in the EXPOSURE menu.

B.1 IR level adjustment

The IR level is preset at the factory. However, an adjustment potentiometer is provided on the OSD control board for environments where the image brightness in dark conditions is not satisfactory after performing a Software Setup of the camera. To adjust the IR level of the camera:

1. With the camera operating in a dark environment, remove the camera dome to access the OSD control board.

2. While observing the video image from the camera, use a #1 phillips screwdriver to turn the IR level adjustment potentiometer clockwise and/or counter-clockwise until the image brightness is acceptable.



3. Reinstall the camera dome.

APPENDIX C
Camera Dimensions

BLK-CPV700RH